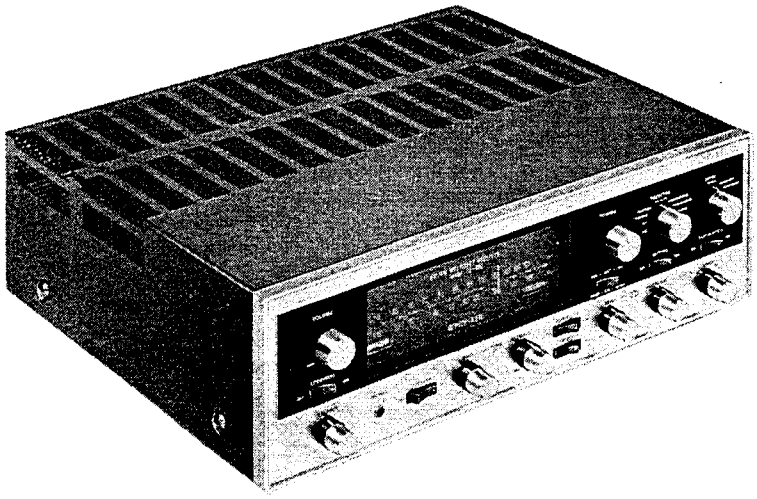
PIONEER®

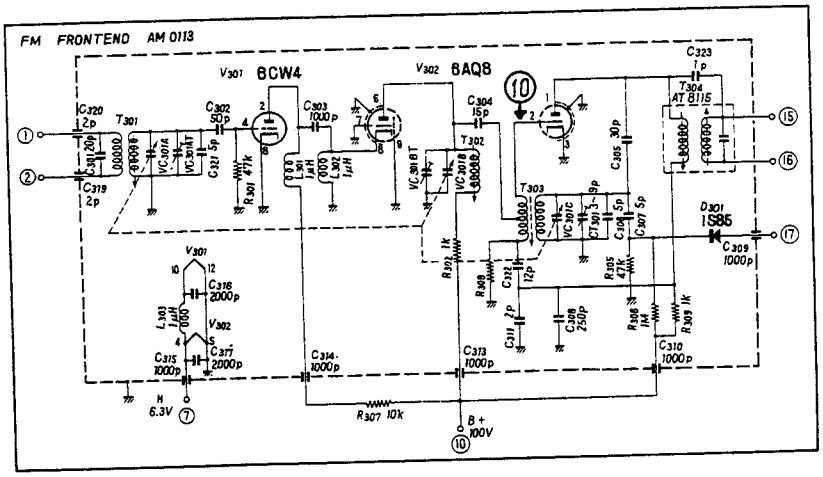
# SERVICE MANUAL

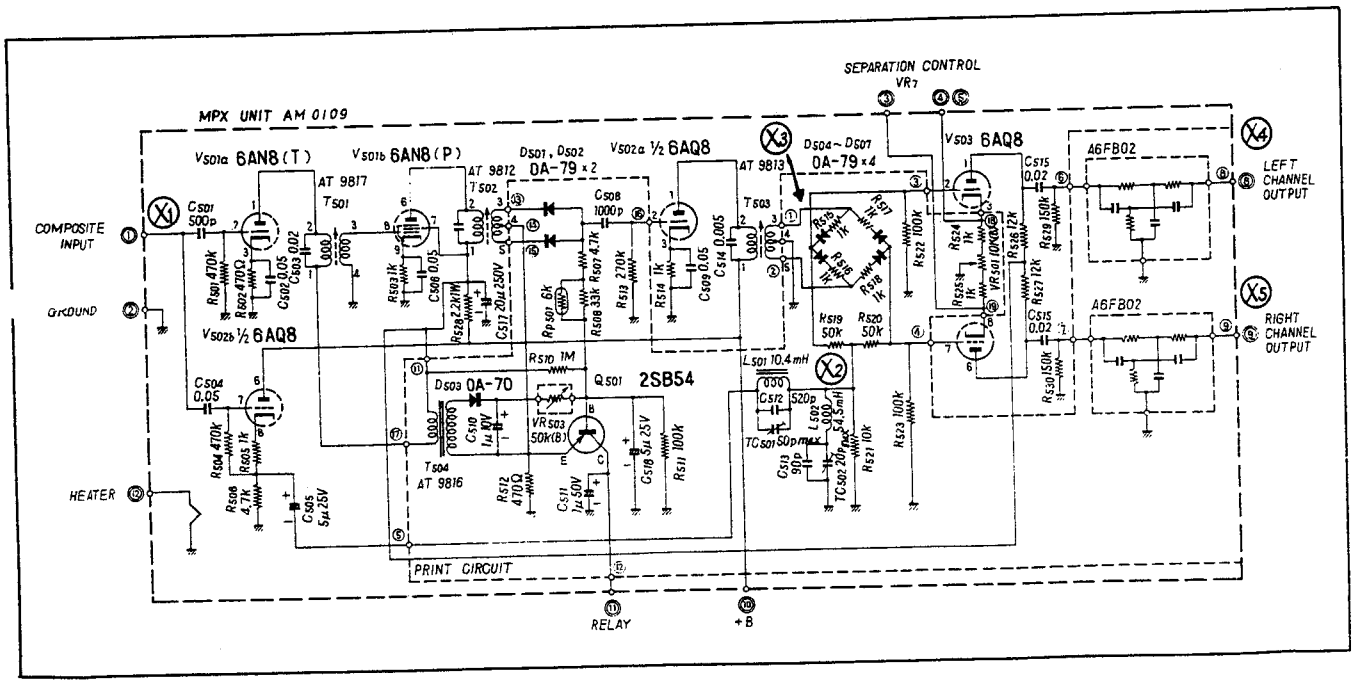


## AM/FM MULTIPLEX RECEIVER

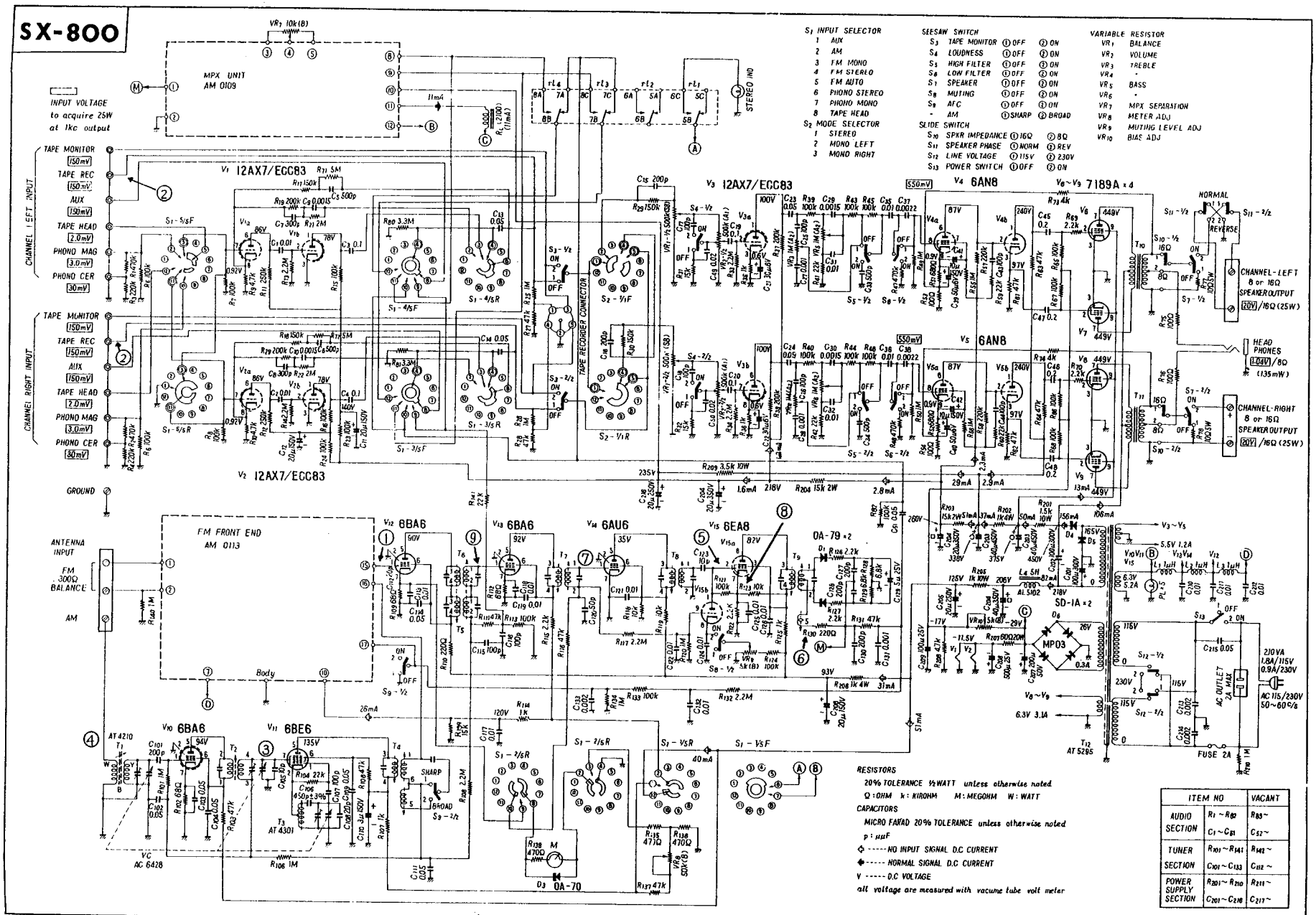
# SX-800

PIONEER ELECTRONIC CORPORATION
TOKYO JAPAN


FM FRONTEND AM 0113
V301 6CW4
V302 6AQ8
D301 1S85
H 6.3V
B+ 100V

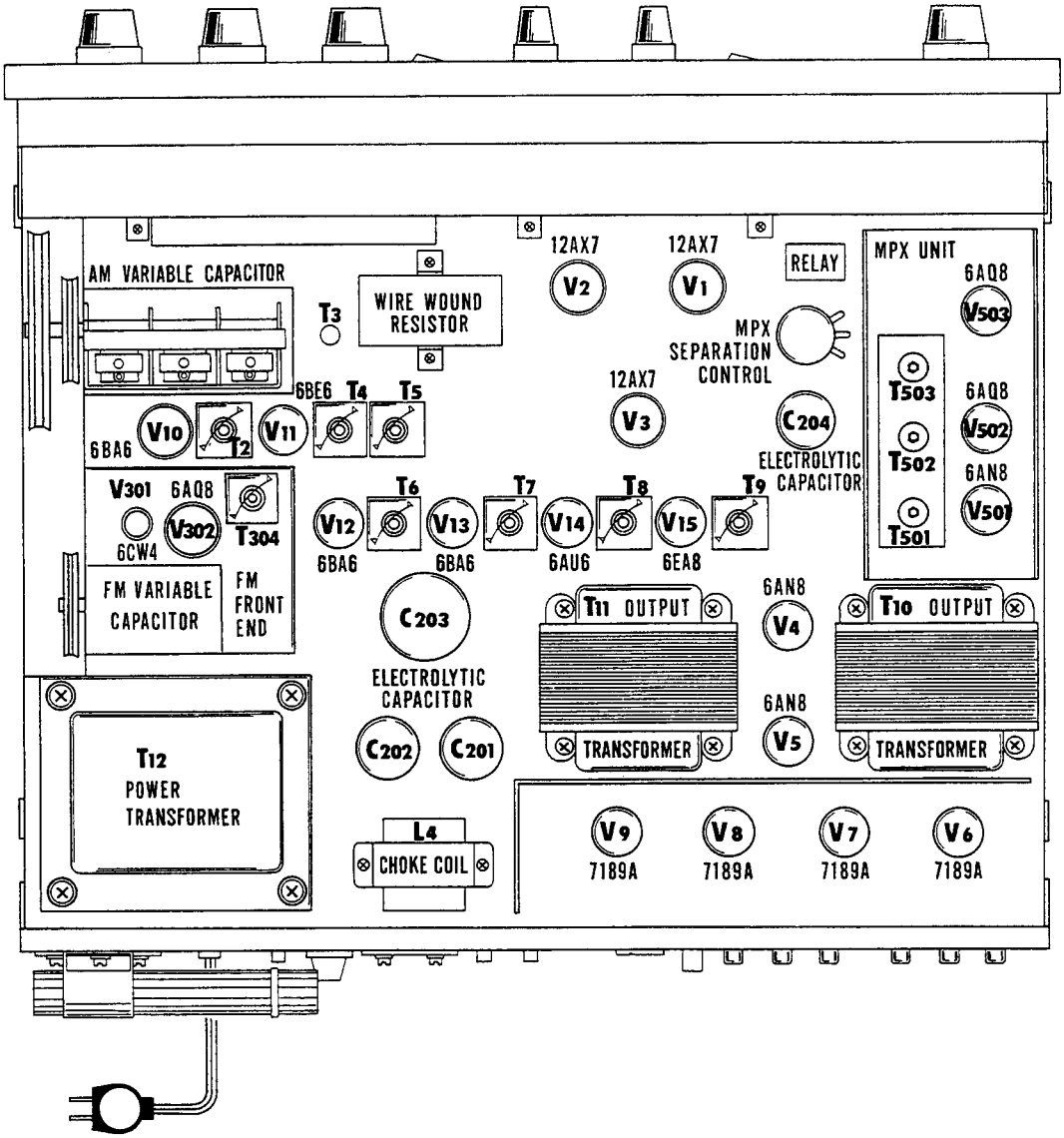

MPX UNIT AM 0109
SEPARATION CONTROL VR7
V501a 6AN8(T)
V501b 6AN8(P)
V502a ½ 6AQ8
V502b ½ 6AQ8
V503 6AQ8
D501, D502 0A-79 x2
D504~D507 0A-79 x4
D503 0A-70
Q501 2SB54
A6FB02
COMPOSITE INPUT
GROUND
HEATER
LEFT CHANNEL OUTPUT
RIGHT CHANNEL OUTPUT
PRINT CIRCUIT
RELAY
+B

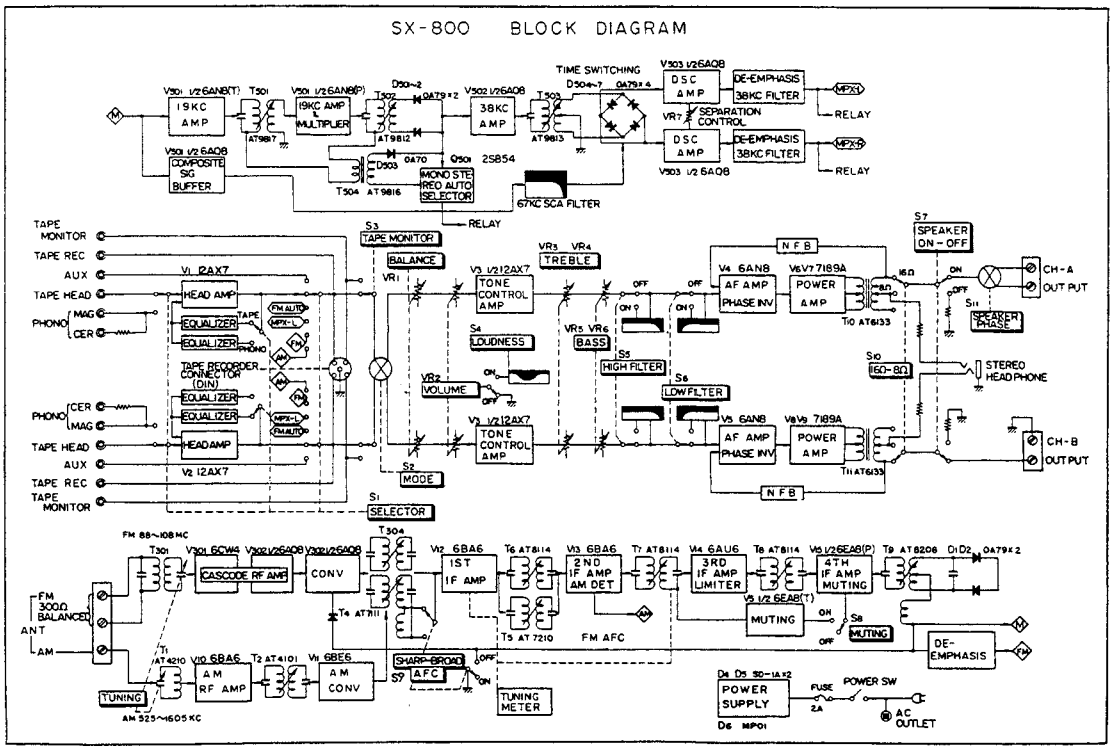
# SX-800




| ITEM NO | | VACANT |
|---|---|---|
| AUDIO SECTION | $R_1$ ~ $R_{82}$ | $R_{83}$ ~ |
| | $C_1$ ~ $C_{81}$ | $C_{82}$ ~ |
| TUNER SECTION | $R_{101}$ ~ $R_{141}$ | $R_{142}$ ~ |
| | $C_{101}$ ~ $C_{133}$ | $C_{132}$ ~ |
| POWER SUPPLY SECTION | $R_{201}$ ~ $R_{210}$ | $R_{211}$ ~ |
| | $C_{201}$ ~ $C_{216}$ | $C_{217}$ ~ |

# SX-800 LAYOUT



# ALIGNMENT INSTRUCTION

Please read these Instructions with extreme care before attempting alignment.

+ Test Equipment
  1) Standard Signal Generator  2) VTVM. DC, AC
  3) Oscilloscope

+ Attention on Alignment
  1) Signal Generator Input: in every case, use the minimum generator input that will obtain a satisfactory output indication.
  2) When connecting the test equipment to the input, use the shielded wire as short as possible.

+ VTVM and Oscilloscope should be connected in parallel at the output.

## + Alignment of AM Section

+ Note: Position of Switch: SELECTOR - AM
MODE - STEREO NORMAL
Position of Volume Control: MINIMUM

| STEPS | Signal Generator Input | | | Dial Setting | Connect VTVM | Alignment | |
|---|---|---|---|---|---|---|---|
| | Coupling | Freq. | Modu. | | | Adjust | Remarks |
| 1 | Pin 1 of $V_{12}$ (6BA6) (1) | 455 kc | 1 kc 30% | Point of no interference as near as 535 kc | AC VTVM to audio output (2) | $T_5$ top and bottom | Adjust to get MAX deflection |
| 2 | On Step 3, at first set the band width selector switch (S9) to SHARP, after that set the (S9) to BROAD. From step 4, (S9) should be set at SHARP position. | | | | | | |
| 3 | Pin 7 of $V_{11}$ (6BE6) (3) | 455 kc | 1 kc 30% | " | " | $T_4$ top and bottom | " |
| 4 | Antenna terminal through dummy (0.1 uF) (4) | 600 kc | " | 600 kc | " | $T_1$, $T_2$ and $T_3$ | " |
| 5 | " | 1400 kc | " | 1400 kc | " | $CT_1$, $CT_2$ and $CT_3$ | |
| 6 | Repeat STEPS 4 and 5 until no further improvement is possible. | | | | | | |

## Alignment of FM Section

Note: 1) Position of Switch: SELECTOR-FM
AFC-OFF
2) Position of Volume Control: MINIMUM
3) Connect VTVM and Oscilloscope in parallel at STEPS 10, 11.

| STEPS | Signal Generator Input | | | Dial | Connect VTVM | Alignment | |
|---|---|---|---|---|---|---|---|
| | Coupling | Frequency | Modu. | Setting | | Adjust | Remarks |
| 1 | Pin 2 of $V_{15}$ (6EA8) (5) | 10.7 mc 100 db | None | Point of no interference as near as 82 mc | DC VTVM to Pin 5 of $T_9$ (6) | Top of $T_9$ | Adjust to get zero volts (between pos. and neg. reading) |
| 2 | " | 10.4 mc 100 db | " | " | " | Bottom of $T_9$ | Adjust to get Maximum deflection |
| 3 | " | 11 mc 100 db | " | " | " | " | Adjust to get Maximum deflection (Neg. reading) |
| 4 | Repeat STEPS 1, 2 and 3 several times to get a similar curve as fig. | | | | | | |
| 5 | Pin 1 of $V_{14}$ (6AU6) (7) | 10.7 mc 100 db | " | " | DC VTVM to Pin 7 of $V_{15}$ (8) | Top and bottom of $T_8$ | " |
| 6 | Pin 1 of $V_{13}$ (6BA6) (9) | 10.7 mc 70 db | " | " | " | Top and bottom of $T_7$ | " |
| 7 | Pin 1 of $V_{12}$ (6BA6) (1) | 10.7 mc 60 db | " | " | " | Top and bottom of $T_6$ | " |
| 8 | Pin 2 of $V_{302}$ (6AQ8) (10) | 10.7 mc 50 db | " | " | " | Top and bottom of $T_{304}$ | " |
| 9 | Repeat STEPS 5,6,7 and 8 several, times to get a similar curve as fig. | | | | | | |
| 10 | FM antenna terminal | 90 mc 18 db | 1 kc 30% | 90 mc | AC VTVM to audio output (2) | $T_{301}$, $T_{302}$, & $T_{303}$ | Adjust to get Maximum deflection |
| 11 | " | 105 mc 18 db | " | 105 mc | " | $VC_{301AT}$ $VC_{301BT}$ $CT_{301}$ | " |
| 12 | Repeat STEPS 10 and 11 until no further improvement is possible. | | | | | | |

## Alignment of MPX Section

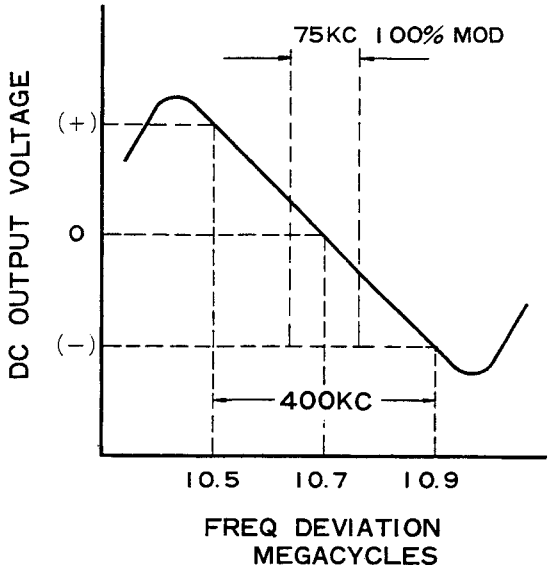
+ Note: 1) Position of Switch: SELECTOR-FM MPX
2) " AFC - OFF
3) Position of Main Volume Control: MINIMUM

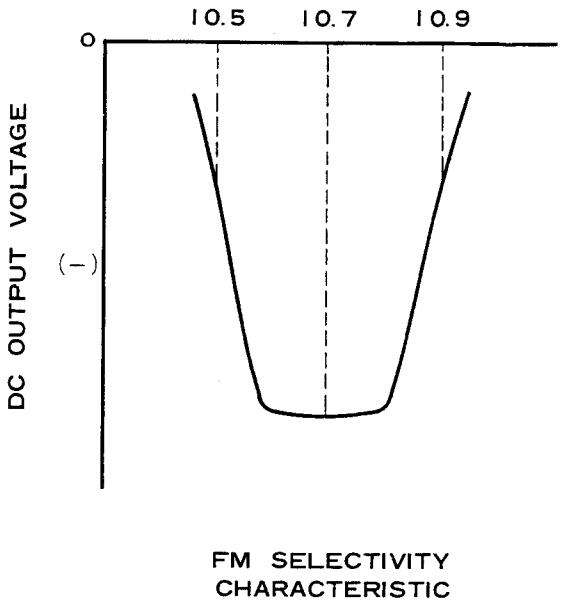
| STEPS | Circuit to be adjusted | Signal Generator Input | | | Connect VTVM | Alignment | |
|---|---|---|---|---|---|---|---|
| | | Coupling | Input Signal | Modu. | | Adjust | Remarks |
| 1 | 67 kc Reject Filter | Audio Oscillator to (X1) | 65.5 kc 68.5 kc 300 mv (rms) | None | R521 (X2) | 65.5 kc $TC_{501}$ 68.5 kc $TC_{502}$ | Adjust to get Minimum deflection |
| 2 | Sub Carrier Circuit | Multiplex Generator to FM Antenna terminal | 60 db of 19 kc Pilot Signal | 10% | T503 (X3) | $T_{501}$ $T_{502}$ $T_{503}$ | Adjust to get Maximum deflection from $T_{503}$ to $T_{502}$ and $T_{501}$ reversely, repeating several times |
| 3 | Pilot phase | " | 60 db Composite Signal each channel | 19 kc Pilot 10% & Sub & Main 1 kc 30% | (X4) or (X5) | $T_{501}$ $T_{502}$ $T_{503}$ | Adjust to get Maxumum output and Minimum distortion, confirm each channel |
| 4 | Audio Gain Balance | " | " | " | " | $VR_{501}$ | Adjust to get same output to each channel |
| 5 | Separation Control | " | " | " | " | $VR_7$ | Adjust to get Minimum output of reverse channel, confirm each channel |
| 6 | Repeat STEPS 3, 4 and 5 several times | | | | | | |
| 7 | Stereo Indicator light | " | 20 db 19 kc pilot signal | 19 kc 10% | - | $VR_{503}$ | Adjust to glow STEREO indicator when 19 kc pilot signal is applied, |

Note: 1) Couple VTVM and Oscilloscope in parallel so as to observe ripples simultaneously.

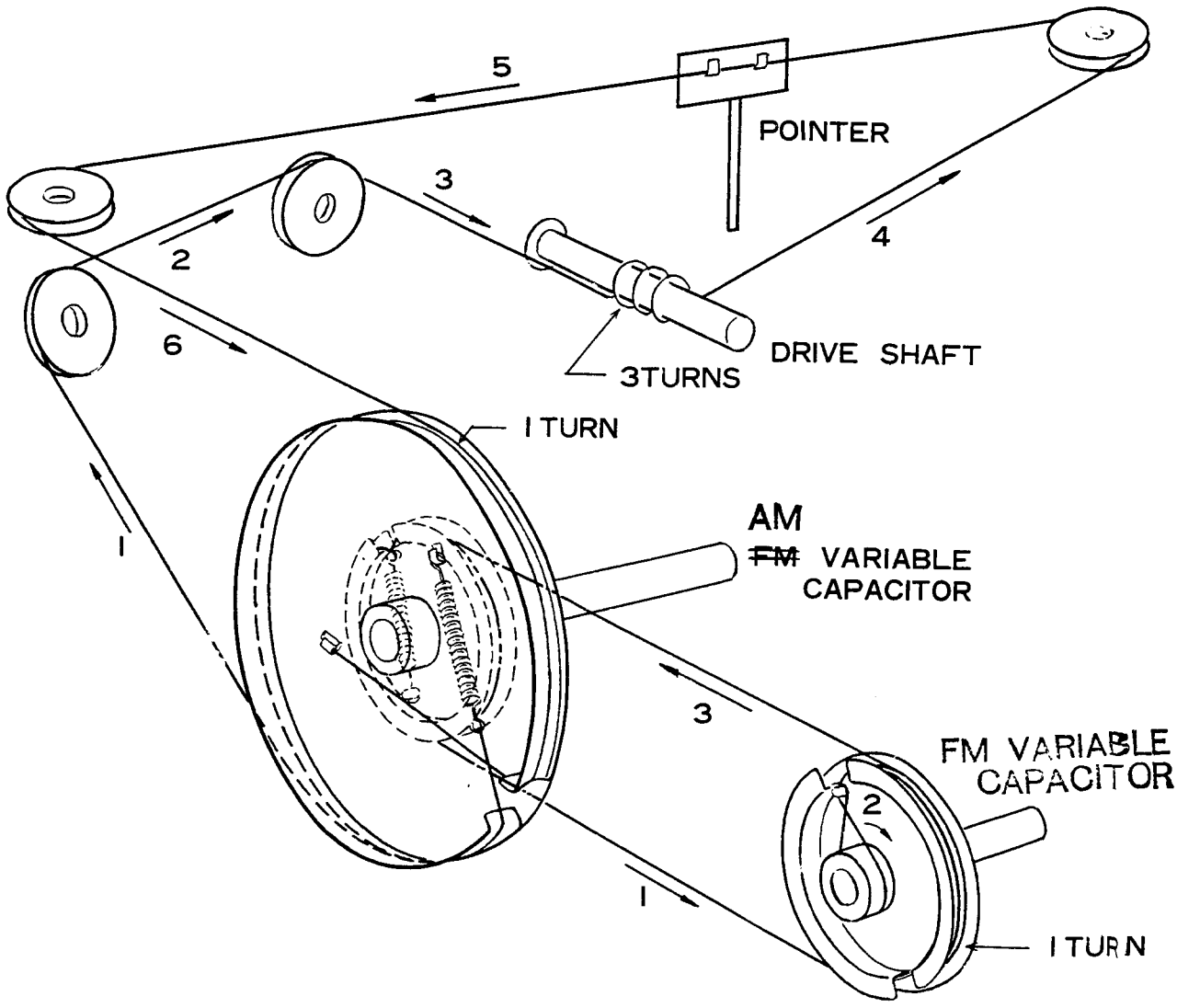
2) At step 2, 1 megohm is indispensable in coupling VTVM to pin 3 of $T_{503}$ in series.

3) At steps 3, 4 and 5, apply the Composite signal to FM antenna terminal and measurement must be made on each right and left channel separately.




## SX-800 DIAL CORD STRINGING



# PARTS LIST SX-800

## CAPACITORS

In uF, 20% tolerance for all fixed capacitors unless otherwise noted. P = uuF

| Symbol | Description | | | | Part No. |
|---|---|---|---|---|---|
| C1 | Oil paper | 0.01 | | 400v | |
| C2 | Oil paper | 0.01 | | 400v | |
| C3 | Mylar | 0.1 | | 400v | |
| C4 | Mylar | 0.1 | | 400v | |
| C5 | Mica | 500p | 10% | 400v | |
| C6 | Mica | 500p | 10% | 400v | |
| C7 | Mica | 300p | 10% | 400v | |
| C8 | Mica | 300p | 10% | 400v | |
| C9 | Ceramic | 0.0015 | 10% | 400v | |
| C10 | Ceramic | 0.0015 | 10% | 400v | |
| C11 | Electrolytic | 20 | | 150v | |
| C12 | Electrolytic | 20 | | 150v | |
| C13 | Mylar | 0.05 | | 50v | |
| C14 | Mylar | 0.05 | | 50v | |
| C15 | Mica | 200p | 10% | 400v | |
| C16 | Mica | 200p | 10% | 400v | |
| C17 | Mica | 100p | 10% | 400v | |
| C18 | Mica | 100p | 10% | 400v | |
| C19 | Mylar | 0.1 | | 50v | |
| C20 | Mylar | 0.1 | | 50v | |
| C21 | Electrolytic | 30 | | 6v | |
| C22 | Electrolytic | 30 | | 6v | |
| C23 | Oil paper | 0.05 | | 400v | |
| C24 | Oil paper | 0.05 | | 400v | |
| C25 | Mica | 100p | 10% | 400v | |
| C26 | Mica | 100p | 10% | 400v | |
| C27 | Ceramic | 0.001 | 10% | 400v | |
| C28 | Ceramic | 0.001 | 10% | 400v | |
| C29 | Ceramic | 0.0015 | 10% | 400v | |
| C30 | Ceramic | 0.0015 | 10% | 400v | |
| C31 | Ceramic | 0.01 | 10% | 400v | |
| C32 | Ceramic | 0.01 | 10% | 400v | |
| C33 | Mica | 500p | 10% | 400v | |
| C34 | Mica | 500p | 10% | 400v | |
| C35 | Ceramic | 0.01 | 10% | 400v | |
| C36 | Ceramic | 0.01 | 10% | 400v | |
| C37 | Ceramic | 0.0022 | 10% | 400v | |
| C38 | Ceramic | 0.0022 | 10% | 400v | |
| C39 | Electrolytic | 50 | | 6v | |
| C40 | Electrolytic | 50 | | 6v | |
| C41 | Electrolytic | 10 | | 150v | |
| C42 | Electrolytic | 10 | | 150v | |
| C43 | Mica | 100p | 10% | 400v | |
| C44 | Mica | 100p | 10% | 400v | |
| C45 | Mylar | 0.2 | | 400v | |
| C46 | Mylar | 0.2 | | 400v | |

| Symbol | Description | | | | Part No. |
|---|---|---|---|---|---|
| C47 | Mylar | 0.2 | | 400v | |
| C48 | Mylar | 0.2 | | 400v | |
| C49 | Oil paper | 0.02 | | 400v | |
| C50 | Oil paper | 0.02 | | 400v | |
| C51 | Mylar | 0.05 | | 50v | |
| C101 | Mica | 200p | 10% | 400v | |
| C102 | Oil paper | 0.05 | | 400v | |
| C103 | Oil paper | 0.05 | | 400v | |
| C104 | Oil paper | 0.05 | | 400v | |
| C105 | Ceramic | 10p | 10% | 400v | |
| C106 | Mica | 450p | ±3% | 400v | |
| C107 | Mica | 100p | 10% | 400v | |
| C108 | Ceramic | 20p | 10% | 400v | |
| C109 | Oil paper | 0.05 | | 400v | |
| C110 | Electrolytic | 3 | | 150v | |
| C111 | Oil paper | 0.05 | | 400v | |
| C113 | Ceramic | 0.01 | | 400v | |
| C114 | Ceramic | 0.01 | | 400v | |
| C115 | Mica | 100p | 10% | 400v | |
| C116 | Mica | 100p | 10% | 400v | |
| C118 | Ceramic | 0.01 | | 400v | |
| C119 | Ceramic | 0.01 | | 400v | |
| C120 | Ceramic | 50p | 10% | 400v | |
| C121 | Ceramic | 0.01 | | 400v | |
| C122 | Ceramic | 0.01 | | 400v | |
| C123 | Ceramic | 10p | 10% | 400v | |
| C124 | Ceramic | 0.01 | | 400v | |
| C125 | Ceramic | 0.01 | | 400v | |
| C126 | Ceramic | 0.01 | | 400v | |
| C127 | Mica | 200p | 10% | 400v | |
| C128 | Mica | 200p | 10% | 400v | |
| C129 | Electrolytic | 5 | | 25v | |
| C130 | Mica | 200p | 10% | 400v | |
| C131 | Ceramic | 0.001 | 10% | 400v | |
| C132 | Ceramic | 0.01 | | 400v | |
| C133 | Ceramic | 0.002 | 10% | 400v | |
| C201 | Electrolytic | 100 | | 300v | |
| C202 | Electrolytic | 100 | | 300v | |
| C203 | Electrolytic | 40+40 | | 450v | |
| C204 | Electrolytic | 40+20+20 | | 350v | |
| C205 | Electrolytic | 20 | | 250v | |
| C206 | Electrolytic | 20 | | 150v | |
| C207 | Electrolytic | 200 | | 50v | |
| C208 | Electrolytic | 500 | | 25v | |
| C209 | Electrolytic | 100 | | 25v | |
| C210 | Ceramic | 0.01 | 10% | 400v | |
| C211 | Ceramic | 0.01 | 10% | 400v | |
| C212 | Ceramic | 0.01 | 10% | 400v | |
| C213 | Ceramic | 0.002 | 10% | 1400v | UL Approved |
| C214 | Ceramic | 0.002 | 10% | 1400v | UL Approved |

| Symbol | Description | | | Part No. |
|---|---|---|---|---|
| C215 | Oil paper | 0.05 | 400v | |
| C216 | Electrolytic | 20 | 250v | |
| VC | Variable Capacitor ( AM ) | | | AC6428 |

RESISTORS

In ohm, 10% tolerance, 1/2 Watt, unless otherwise marked or noted. K=Kilohm, M=Megohm.

| Symbol | Description | | | Part No. |
|---|---|---|---|---|
| R1 | Composition | 470k | | |
| R2 | Composition | 470k | | |
| R3 | Composition | 220k | | |
| R4 | Composition | 220k | | |
| R5 | Composition | 100k | | |
| R6 | Composition | 100k | | |
| R7 | Composition | 100k | 20% | |
| R8 | Composition | 100k | 20% | |
| R9 | Carbon | 4.7k | | |
| R10 | Carbon | 4.7k | | |
| R11 | Carbon | 250k | | |
| R12 | Carbon | 250k | | |
| R13 | Composition | 2.2m | 20% | |
| R14 | Composition | 2.2m | 20% | |
| R15 | Carbon | 100k | | |
| R16 | Carbon | 100k | | |
| R17 | Composition | 150k | | |
| R18 | Composition | 150k | | |
| R19 | Carbon | 200k | | |
| R20 | Carbon | 200k | | |
| R21 | Carbon | 2m | | |
| R22 | Carbon | 2m | | |
| R23 | Composition | 100k | 20% | |
| R24 | Composition | 100k | 20% | |
| R25 | Composition | 1m | | |
| R26 | Composition | 1m | | |
| R27 | Composition | 47k | | |
| R28 | Composition | 47k | | |
| R29 | Composition | 150k | | |
| R30 | Composition | 150k | | |
| R31 | Composition | 15k | | |
| R32 | Composition | 15k | | |
| R33 | Composition | 2.2m | 20% | |
| R34 | Composition | 2.2m | 20% | |
| R35 | Composition | 1k | | |

| Symbol | Description | | | Part No. |
|---|---|---|---|---|
| R36 | Composition | 1k | | |
| R37 | Carbon | 200k | | |
| R38 | Carbon | 200k | | |
| R39 | Composition | 100k | | |
| R40 | Composition | 100k | | |
| R41 | Composition | 22k | | |
| R42 | Composition | 22k | | |
| R43 | Composition | 100k | | |
| R44 | Composition | 100k | | |
| R45 | Composition | 100k | | |
| R46 | Composition | 100k | | |
| R47 | Composition | 470k | | |
| R48 | Composition | 470k | | |
| R49 | Composition | 1m | 20% | |
| R50 | Composition | 1m | 20% | |
| R51 | Composition | 680 | | |
| R52 | Composition | 680 | | |
| R53 | Carbon | 100 | | |
| R54 | Carbon | 100 | | |
| R55 | Composition | 1m | 20% | |
| R56 | Composition | 1m | 20% | |
| R57 | Composition | 220k | | |
| R58 | Composition | 220k | | |
| R59 | Composition | 22k | | |
| R60 | Composition | 22k | | |
| R61 | Composition | 47k | | |
| R62 | Composition | 47k | | |
| R63 | Composition | 47k | | |
| R64 | Composition | 47k | | |
| R65 | Composition | 100k | | |
| R66 | Composition | 100k | | |
| R67 | Composition | 100k | | |
| R68 | Composition | 100k | | |
| R69 | Composition | 2.2k | | |
| R70 | Composition | 2.2k | | |
| R71 | Carbon | 5m | | |
| R72 | Carbon | 5m | | |
| R73 | Carbon | 4k | | |
| R74 | Carbon | 4k | | |
| R75 | Composition | 100 | | |
| R76 | Composition | 100 | | |
| R77 | Wire wound | 10 | | 5w |
| R78 | Wire wound | 10 | | 5w |
| R80 | Composition | 3.3m | 20% | |
| R81 | Composition | 3.3m | 20% | |
| R82 | Composition | 100k | 20% | |
| R101 | Composition | 1m | 20% | |
| R102 | Composition | 68 | 20% | |
| R103 | Composition | 4.7k | | |
| R104 | Composition | 22k | | |
| R105 | Composition | 1m | 20% | |
| R106 | Composition | 4.7k | | |
| R107 | Composition | 1k | 20% | |

| Symbol | Description | | | | Part No. |
|---|---|---|---|---|---|
| R108 | Composition | 2.2m | 20% | | |
| R109 | Composition | 68 | 20% | | |
| R110 | Composition | 220 | | | |
| R111 | Composition | 47k | | | |
| R112 | Composition | 68 | 20% | | |
| R113 | Composition | 100k | | | |
| R114 | Carbon | 1k | | 2w | |
| R115 | Composition | 2.2k | | | |
| R116 | Composition | 47k | | | |
| R117 | Composition | 2.2m | 20% | | |
| R118 | Composition | 10k | | | |
| R119 | Composition | 10k | | | |
| R120 | Composition | 1m | 20% | | |
| R121 | Composition | 100k | | | |
| R122 | Composition | 2.2k | | | |
| R123 | Composition | 8.2k | | | |
| R124 | Composition | 100k | | | |
| R125 | Composition | 1k | 20% | | |
| R126 | Composition | 2.2k | | | |
| R127 | Composition | 2.2k | | | |
| R128 | Composition | 6.8k | | | |
| R129 | Composition | 6.8k | | | |
| R130 | Composition | 220 | 20% | | |
| R131 | Composition | 47k | | | |
| R132 | Composition | 2.2m | 20% | | |
| R133 | Composition | 100k | | | |
| R134 | Composition | 1m | | | |
| R135 | Composition | 470 | 20% | | |
| R136 | Composition | 470 | 20% | | |
| R137 | Composition | 47k | 20% | | |
| R138 | Composition | 470 | | | |
| R139 | Carbon | 15k | | 2w | |
| R140 | Composition | 1m | 20% | | |
| R141 | Composition | 22k | | | |
| | | | | | |
| R201 | Wire wound | 1.5k | | 10w | |
| R202 | Wire wound | 1k | | 4w | |
| R203 | Wire wound | 15k | | 2w | |
| R204 | Wire wound | 15k | | 2w | |
| R205 | Wire wound | 1k | | 10w | |
| R206 | Wire wound | 1k | | 4w | |
| R207 | Wire wound | 60 | | 20w | |
| R208 | Composition | 4.7k | 20% | | |
| R209 | Wire wound | 3.5k | | 10w | |
| R210 | Composition | 1m | 20% | | |

## POTENTIOMETERS

| Symbol | Description | Part No. |
|---|---|---|
| VR1 | BALANCE 500 kilohm dual tandem | AR8541 |
| VR2 | VOLUME 500 kilohm dual tandem | AR8542 |
| VR3 | TREBLE 1 megohm | AR8227 |
| VR4 | TREBLE 1 megohm | AR8227 |
| VR5 | BASS 1 megohm | AR8227 |
| VR6 | BASS 1 megohm | AR8227 |
| VR7 | MPX Separation 10 kilohm (Semifixed) | AR0014 |
| VR8 | AM Tuning Meter Sens, 50 kilohm (Semifixed) | AR0015 |
| VR9 | Muting Level Adj., 5 kilohm (Semifixed) | AR0016 |
| VR10 | Bias Level Adj., 5 kilohm (Semifixed) | AR0016 |

## TRANSFORMERS & COILS

| Symbol | Description | Part No. |
|---|---|---|
| T1 | Ferrite Stick Antenna | AT4210 |
| T2 | AM RF Coil | AT4101 |
| T3 | MW OSC, Coil | AT4301 |
| T4 | AM IFT | AT7111A |
| T5 | AM IFT (Det) | AT7210A |
| T6 | FM IFT | AT8114 |
| T7 | FM IFT | AT8114 |
| T8 | FM IFT | AT8114 |
| T9 | FM IFT (DET) | AT8208 |
| T10 | Output Transformer | AT6133 |
| T11 | Output Transformer | AT6133 |
| T12 | Power Transformer | AT5295 |
| | | |
| L1 | Heater Choke Coil 1uH | AL0502 |
| L2 | Heater Choke Coil 1uH | AL0502 |
| L3 | Heater Choke Coil 1uH | AL0502 |
| L4 | Choke Coil 5H | AL5102 |

## TUBES & DIODES

| Symbol | Description | Part No. |
|---|---|---|
| V1 | 12AX7 Audio Amp | |
| V2 | 12AX7 Audio Amp | |
| V3 | 12AX7 Audio Amp | |
| V4 | 6AN8 Audio Amp | |
| V5 | 6AN8 Audio Amp | |

| Symbol | Description | Part No. |
|---|---|---|
| V6 | 7189A Power Amp | |
| V7 | 7189A Power Amp | |
| V8 | 7189A Power Amp | |
| V9 | 7189A Power Amp | |
| V10 | 6BA6 IF Amp | |
| V11 | 6BE6 AM-RF, OSC, MIX | |
| V12 | 6BA6 IF Amp | |
| V13 | 6BA6 IF Amp | |
| V14 | 6AU6 FM IF Amp | |
| V15 | 6EA8 FM IF Amp, MUTING | |
| | | |
| D1 | OA79 FM-Det, Germanium Diode | |
| D2 | OA79 FM-Det, Germanium Diode | |
| D3 | OA70 Tuning Meter, Germanium Diode | |
| D4 | SD-1A Power Rectifier Silicon Diode | |
| D5 | SD-1A Power Rectifier Silicon Diode | |
| D6 | MP01 Power Rectifier Silicon Diode | |

MISCELLANEOUS

| Symbol | Description | Part No. |
|---|---|---|
| S1 | INPUT SELECTOR | AS1624 |
| S2 | MODE SELECTOR | AS1625 |
| S3 | TAPE MONITOR (OFF-ON) | AS0210 |
| S4 | LOUDNESS (OFF-ON) | AS0210 |
| S5 | HIGH FILTER (OFF-ON) | AS0210 |
| S6 | LOW FILTER (OFF-ON) | AS0210 |
| S7 | SPEAKER (OFF-ON) | AS0210 |
| S8 | MUTING (OFF-ON) | AS0210 |
| S9 | FM AFC (OFF-ON) | AS0210 |
| | AM SELECT (SHART-BROAD) | AS0210 |
| S10 | SPKR, IMPEDANCE (16 ohm - 8 ohm) | AS6216 |
| S11 | SPKR, PHASE (NORM-REV) | AS6216 |
| S12 | LINE VOLTAGE (115V-230V) | AS6216 |
| S13 | POWER SWITCH | AS0213 |
| | | |
| RL | Relay | AS8402 |
| | Pilot Lamp 8V | AV7206 |
| | Fuse 2A | |
| | | |
| | Phone Jack | AK7204 |
| | Fuse Holder | AK9603 |
| | Tape Recorder Connector | AK5803 |
| | | |
| | Tuning Pully | AM4104 |
| | Tuning Pully | AM4185 |

| Description | Part No. |
|---|---|
| Tuning Meter | AA1182 |
| Dial Pointer | AA3166 |
| Dial Scale | AA3284C |
| KNOB INPUT SELECTOR | AA1190 |
| MODE SELECTOR | AA1190 |
| VOLUME | AA1188 |
| TUNING | AA1185 |
| BALANCE | AA1182 |
| TONE BASS | AA1182 |
| POWER | AA1182 |
| Terminal Audio Input | AP2113 |
| Terminal Antenna Input | AP3111 |
| Terminal Speaker Output | AP3113 |
| Attenuator (FM Antenna) | AM0126 |

MULTIPLEX SECTION (AM0109)

CAPACITORS

In uF, 20% tolerance for all fixed capacitors unless otherwise noted. P=uuF

| Symbol | Description | | | | Part No. |
|---|---|---|---|---|---|
| C501 | Mica | 500p | 10% | 50v | |
| C502 | Mylar | 0.05 | | 50v | |
| C503 | Mica | 0.02 | 10% | 50v | |
| C504 | Mylar | 0.05 | | 50v | |
| C505 | Electrolytic | 5 | | 25v | |
| C506 | Mylar | 0.05 | | 50v | |
| C507 | Mica | 0.01 | 10% | 50v | |
| C508 | Stilor | 1000p | | 50v | |
| C509 | Mylar | 0.05 | | 50v | |
| C510 | Electrolytic | 1 | | 10v | |
| C511 | Electrolytic | 1 | | 50v | |
| C512 | Polyethylene | 520p | 5% | 50v | |
| C513 | Polyethylene | 90p | 5% | 50v | |
| C514 | Mica | 0.005 | 10% | 50v | |
| C515 | Mylar | 0.02 | | 250v | |
| C516 | Mylar | 0.02 | | 250v | |
| C517 | Electrolytic | 20 | | 250v | |
| C518 | Electrolytic | 5 | | 25v | |
| CT501 | Trimmer Capacitor | | | | AC3312 |
| CT502 | Trimmer Capacitor | | | | AC3311 |
| Packaged Component | Twin-T Filter | | | | AC9606 |

## TUBES & DIODES

| Symbol | Description | Part No. |
|---|---|---|
| V501 | 6AN8 | |
| V502 | 6AQ8 | |
| V503 | 6AQ8 | |
| D501 | 0A79 | |
| D502 | 0A79 | |
| D503 | 0A70 | |
| D504 | 0A79 | |
| D505 | 0A79 | |
| D506 | 0A79 | |
| D507 | 0A79 | |
| Q501 | 2SB54 | |
| RP501 | Positive Thermistor | |

## RESISTORS

In ohm, 10% tolerance, 1/2 Watt, unless otherwise Marked or noted. K=Kilohm, M=Megohm.

| Symbol | Description | | | Part No. |
|---|---|---|---|---|
| R501 | Composition | 470k | | |
| R502 | Composition | 470 | | |
| R503 | Composition | 1k | | |
| R504 | Composition | 470k | | |
| R505 | Composition | 1k | | |
| R506 | Composition | 4.7k | | |
| R507 | Composition | 4.7k | | |
| R508 | Composition | 33k | | |
| R510 | Composition | 1m | | |
| R511 | Composition | 100k | | |
| R512 | Composition | 470 | | |
| R513 | Composition | 270k | | |
| R514 | Composition | 1k | | |
| R515 | Carbon | 1k | | |
| R516 | Carbon | 1k | | |
| R517 | Carbon | 1k | | |
| R518 | Carbon | 1k | | |
| R519 | Carbon | 50k | 5% | |
| R520 | Carbon | 50k | 5% | |
| R521 | Carbon | 10k | 5% | |

| Symbol | Description | | | Part No. |
|---|---|---|---|---|
| R522 | Composition | 100k | | |
| R523 | Composition | 100k | | |
| R524 | Composition | 1k | | |
| R525 | Composition | 1k | | |
| R526 | Composition | 12k | | |
| R527 | Composition | 12k | | |
| R528 | Composition | 2.2k | 1w | |
| R529 | Composition | 150k | | |
| R530 | Composition | 150k | | |

POTENTIOMETERS

| Symbol | Description | Part No. |
|---|---|---|
| VR501 | Variable Resistor Semifixed 2 kilohm | AR0013 |
| VR503 | Variable Resistor Semifixed 50 kilohm | AR0015 |

TRANSFORMERS & COILS

| Symbol | Description | Part No. |
|---|---|---|
| T501 | 19KC | AT9817 |
| T502 | 19KC | AT9812 |
| T503 | 38KC | AT9813 |
| T504 | Noise Pick-up Coil | AT9816 |
| L501 | 49mH | AL9814 |
| L502 | 10mH | AL9815 |

FRONT-END SECTION AM0120(U)

CAPACITORS

In uF, 10% tolerance for all fixed capacitors unless otherwise noted. P=uuF

| Symbol | Description | | | Part No. |
|---|---|---|---|---|
| C301 | Ceramic | 20p | 400v | |
| C302 | Ceramic | 50p | 400v | |
| C303 | Ceramic | 0.001 | 400v | |
| C304 | Ceramic | 15p | 400v | |
| C305 | Ceramic | 30p | 400v | |

| Symbol | Description | | Part No. |
|---|---|---|---|
| C306 | Ceramic | 5p | 400v |
| C307 | Ceramic | 5p | 400v |
| C308 | Ceramic | 250p | 400v |
| C309 | Feed-thru type Ceramic | 1000p | |
| C310 | Feed-thru type Ceramic | 1000p | |
| C311 | Feed-thru type Ceramic | 2p | |
| C312 | Feed-thru type Ceramic | 1000p | |
| C313 | Feed-thru type Ceramic | 1000p | |
| C314 | Feed-thru type Ceramic | 1000p | |
| C315 | Feed-thru type Ceramic | 1000p | |
| C316 | Ceramic | 0.002 | 400v |
| C317 | Ceramic | 0.002 | 400v |
| C319 | Feed-thru type Ceramic | 2p | |
| C320 | Feed-thru type Ceramic | 2p | |
| C321 | Ceramic | 5p | 400v |
| C322 | Ceramic | 12p | 400v |
| C323 | Ceramic | 1p | 400v |
| C324 | Ceramic | 0.001 | 400v |
| CT301 | Ceramic Trimmer | | AC0302 |
| VC301 | Variable Capacitor (FM) | | AC6429 |

RESISTORS

In ohm, 10% tolerance, 1/2 Watt, unless otherwise Marked or noted. K=Kilohm, M=Megohm.

| Symbol | Description | | Part No. |
|---|---|---|---|
| R301 | Composition | 47k | 1/4w |
| R302 | Composition | 1k | |
| R303 | Composition | 47k | 1/4w |
| R304 | Composition | 1k | |
| R305 | Composition | 47k | |
| R306 | Composition | 1m | |
| R307 | Com;osition | 10k | 1w |
| R308 | Composition | 33k | 1/4w |
| R309 | Composition | 100 | |

## TRANSFORMERS & COILS

| Symbol | Description | Part No. |
|---|---|---|
| T301 | FM Antenna Coil | AL0207 |
| T302 | FM RF Coil | AL0421 |
| T303 | FM OSC Coil | AL0323 |
| T304 | FM IFT | AT8115 |
| L301 | Heater Choke Coil 1uH | |
| L302 | Heater Choke Coil 1uH | |
| L303 | Heater Choke Coil 1uH | |

## TUBES & DIODES

| Symbol | Description | Part No. |
|---|---|---|
| V301 | 6CW4 | |
| V302 | 6AQ8 | |
| D301 | Variable Capacitor Diode 1S85 | |

# TROUBLE SHOOTING

## POWER CIRCUIT

| SYMPTOMS | POSSIBLE CAUSE | TO BE CHECKED |
|---|---|---|
| Does not light up or function at all. | 1) No power supplied. | |
| | a. Severed power cable. | Check where cable enters plug. |
| | b. Defective power switch. | Check contact point. |
| | c. Fuse blown or no fuse inserted. | Replace or insert new fuse. |
| | 2) Fuse blows | |
| | a. Power transformer heat up. | Short between transformer windings layer. |
| | b. Defective insulation in OPT between primary and secondary. | Replace OPT. |
| | c. Short between electrodes in tubes or diodes. | Maily in rectifier or in power tube. |
| | d. Defective electrolytic capacitor. | Mainly in ripple filter circuit. |
| | 3) Emits smoke. | |
| | a. Short in filament wiring. | Check wiring by removing tubes. |
| | b. Defective tube socket. | Mainly poor insulation of wafer-type socket. |
| Light up, but does not function. | 1) Insufficient plate voltage. | |
| | a. Rectifier tube diode burned out. | Replace tube or diode. |
| | b. Resistor in ripple filter circuit burned out. | Replace resistor. |
| | c. No rectifier. | |
| | 2) No voltage at plate circuit. | |
| | a. Primary windings of OPT burned out. | |

## AUDIO CIRCUIT

| SYMPTOMS | POSSIBLE CAUSE |
|---|---|
| Does not function | 1) Power amplifier section<br>a. Severed output transformer(s) windings (primary and secondary).<br>b. Power output tubes damaged or heaters burned out.<br>c. Plate load resistors between each stages burned out.<br>d. Bias resistor in cathode circuit burned out.<br><br>2) Preamplifier section<br>a. Plate load resistors between each stages burned out.<br>b. Poor contact(s) in input selector switch or mode switch.<br>c. Defective cathode resistor.<br>d. Defective de-coupling resistors between each stages.<br>e. Defective tubes. |
| Noises | 1) Tubes<br>a. Defective tubes.<br><br>2) Resistors<br>a. Defective plate resistors, negative feed back resistors, or cathode resistors.<br><br>3) Capacitors<br>a. Defective capacitor, coupling phase compensation circuit.<br><br>4) Potentiometers<br>a. Noise emanating from defective volume control or other variable resistors. |
| Hum | 1) Tubes<br>a. Defective tubes, particularly short between electrodes.<br><br>2) Resistors<br>a. Defective load resistor in phase inverter circuit on cathode end.<br><br>3) Capacitors<br>a. Defective electrolytic capacitors in filter circuit or in de-coupling circuit. |
| Distortion | 1) Transformer<br>a. Defective output transformer, output tubes or rectifier (tube or diode).<br>b. Short between primary and secondary.<br><br>2) Capacitor<br>a. Defective capacitor in output tube bias circuit.<br><br>3) Resistor<br>a. Defective grid leak resistor.<br><br>4) Rectifier<br>a. Defective rectifier in bias circuit when fixed bias circuit employed. |

## AM TUNER CIRCUIT

| SYMPTOMS | POSSIBLE CAUSE | NOTE |
|---|---|---|
| Does not function | a. Defective tubes | |
| | b. Poor contact or defective insulation in input selector or mode switch. | |
| | c. Burnt out resistor in power supply. | |
| | d. Severed winding(s) in IF transformer. | |
| | e. Severed oscillator coil winding. | |
| | f. Short of variable capacitor (tuning) inside mechanism. | |
| | g. Germanium diode in detector circuit is defective. | |
| Poor sensitivity | a. Severed winding in RF coil. | |
| | b. Out of alignment in IF transformer. | |
| | c. Out of tracking alignment. | |
| | d. Defective tubes. | |
| | e. Poor insulation of trimming capacitors. | |
| Distortion | a. Defective germanium diode. | |
| | b. Defective tubes. | |
| | c. Defective tuning indicator tube. | |
| | d. Defect in AVC circuit. | |
| Noise | a. Noise emanating from defective tube. | |
| | b. Occasional short between fixed plate and rotor plate of variable capacitor. | |
| | c. Poor soldering or short between parts. | |

## FM TUNER CIRCUIT

| SYMPTOMS | POSSIBLE CAUSE | NOTE |
|---|---|---|
| Does not function | a. Defective tubes. | |
| | b. Severed winding(s) in IF Transformers. | |
| | c. Poor contact or defective insulation in rotary switch. | |
| | d. Burnt out resistor(s) in power supply. | |
| | e. Loose oscillation coil connection, or poor soldering. | |
| | f. Poor contact between sockets and tube pins. | |
| | g. Defective germanium diode(s). | |
| Poor sensitivity | a. IF transformers out of alignment. | |
| | b. Tracking out of alignment. | |
| | c. Defective tubes. | |
| Distortion | a. Discriminator IF transformer out of alignment. | |
| | b. Defective tubes. | |
| | c. Defective germanium diode(s). | |
| Noises including Microphonic | a. In most cases, due to defective tubes in RF amplifier or local oscillator tube(s). | |
| | b. Poor contact between sockets and tube pins. | |
| | c. Antenna input is not enough. | |
| | d. Inproper mounting variable capacitor. | |
| | e. Poor soldering or short between parts. | |
| | f. Excessive long leads or resistors in RF or IF circuits. | |

## MULTIPLEXE TROUBLE SHOOTING AND REPAIRS

| SYMPTOMS | PROBABLE CAUSE | REPAIRS NECESSARY |
|---|---|---|
| Poor separation | 1. Pilot amplifying circuit (drift in 19 kc transformer, or other faulty components)<br>2. Composite circuit (drift in separation control; or other faulty components) | 1. Readjustment (T501, T502, T503); replacement of components<br>2. Readjustment of separation control; replacement of components |
| Excessive distortion in stereo reception | 1. Pilot amplifier circuit<br>2. Composite circuit (6AQ8, etc.)<br>3. Drop in line power voltage | 1. Readjustment or replacement of components<br>2. Vicinity of 6AQ8<br>3. Provide supply of proper voltage |
| Distortion prevalent at points of high | 1. Inadequate pilot level<br>2. Drop in line power voltage | 1. Readjustment; replacement of faulty components<br>2. Check power supply section |
| Extreme drop in volume in stereo reception | 1. Composite amplifying circuit (Faulty 6AQ8 or components in its vicinity) | 1. Replace 6AQ8 or other faulty components in vicinity of 6AQ8 |
| Separation control completely ineffective (No. change even when separation control adjusted.) | 1. Faulty separation control variable resistor (burntout) | 1. Replace component |
| Poor separation on one channel only | 1. Faulty 38 kc filter (one channel only)<br>2. One of secondary windings of 38 kc transformer severed | 1. Replace component<br>2. Replace component |
| Stereo indicator fails to function | 1. Faulty pilot lamp<br>2. Improper working point | 1. Replace component<br>2. Readjust auto level control (VR503) |

+ Other malfunctions should be dealt with in the same way as for other amplifiers.